

OVENS WITH CATALYTIC CONVERTERS

The invention relates to improvements in ovens with catalytic converters.

It is known to use catalytic converters in ovens in order to reduce the smoke output of ovens, particularly when the ovens are used to cook foods containing fat or grease which is likely to evaporate during the cooking process and cause smoke problems. For example, the present applicant's earlier International Patent Application No. PCT/GB00/04156 (WO 01/38798) describes an oven (2) having catalytic converters (38, 40) positioned outside of a cooking chamber (4). The catalytic converters (38, 40) are positioned downstream of grease filters (34, 36) and upstream of fans (26, 28) which are used to drive air out of the cooking chamber (4), along ducting (19), passed a heating element (20), and back into the cooking chamber (4) through perforations formed in the rear wall (10) of the cooking chamber (4). The grease filters (34, 36), catalytic converters (38, 40) and fans (26, 28) are all located outside of the walls of the cooking chamber (4).

German patent DE 3,636,622 describes an oven in which air is drawn through the centre of a baffle plate (3) by a fan (7), and forced outwardly through a concentric heating element (8) which is provided with strips (9) which are provided with a catalytic coating in order to reduce the smoke and odour content of the air. The strips (9) are connected to the heating element 8 so that they reach the temperature required to achieve the catalytic effect. The air then passes around the edges of the baffle plate (3) and back into the cooking chamber. It will be noted that the catalytic converter strips (9) are therefore located downstream of both the fan (7) and the heating element (8).

German patent DE 4,139,904 shows an oven having a similar arrangement. A fan (6) is used to draw air from a cooking chamber through the centre of a baffle plate (4), and to force the air outwardly through a concentric heating element (7) and then through a concentric catalytic converter (8). The catalytic converter (8) is formed from a porous sponge-like wire mesh on which a catalyst is deposited as a coating. The air then passes back around the edges of the baffle plate (4) into the cooking chamber. It will again

therefore be noted that the catalytic converter (8) is located downstream of the fan (6) and heating element (7).

The invention seeks to provide an improved oven having a catalytic converter, which overcomes at least some of the disadvantages of the prior art.

In accordance with the invention there is provided an oven as set out in the accompanying claims.

The invention will now be more particularly described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows a first embodiment of an oven in accordance with the invention;

Figure 2 shows a second embodiment of an oven in accordance with the invention; and

Figure 3 shows a third embodiment of an oven in accordance with the invention.

Referring to Figure 1, there is shown an oven 2 having a cooking chamber 4 defined by chamber walls 6 and a hinged door 8.

The oven 2 is also provided with a fan 10 driven by an electric motor 12. The fan 10 draws in air through perforations (not shown) in the centre of a baffle plate 14, as indicated by air-flow arrow 16.

The air is then driven outwardly through a heating element 18, and then passes around the edges of the baffle plate 14 and back into the main area of the cooking chamber 4, as indicated by air-flow arrows 20.

It will be appreciated that a function of the baffle plate 14 is to ensure a proper air-flow around the cooking chamber 4, as indicated by arrows 16 and 20. The baffle plate 14 does not form part of the walls 6 of the cooking chamber 4, but is instead mounted

within the cooking chamber 4 by suitable supports (not shown). The baffle plate 14 of course also serves to protect the user from contact with the fan 10 and the cooking element 18. The use of baffle plates for these purposes is of course already known, and such baffle plates are used in existing ovens.

However, the oven of Figure 1 is also provided with a catalytic converter 22 which is mounted, by any suitable means (including screws or nuts and bolts), on the upstream face of the baffle plate 14 so as to cover at least some (and preferably all) of the perforations (not shown) in the baffle plate 14.

The positioning of the catalytic converter 22 in this location was the result of a realization by the applicant that a much thinner catalytic converter could be successfully used than had previously been the case. This resulted from experimentation carried out by the applicant. In fact, the thickness of the catalytic converter 22 used in the oven of Figure 1 is only about 2 cm (measured in a direction perpendicular to the main central portion 15 of the baffle plate 14).

In addition, a grease filter 24 is mounted, again by any suitable means, on the upstream side of the catalytic converter 22 in order to remove any large particles of grease which are present in the air before the air reaches the catalytic converter 22.

It will be appreciated that a number of advantages follow from the positioning of the catalytic converter 22 and grease filter 24 in the oven of Figure 1, and these are described below.

Firstly, the fact that the catalytic converter 22 and grease filter 24 are located upstream of the fan 10 and heating element 18 results in a reduction in the build up of grease on the fan 10 and the heating element 18 themselves. These components therefore require less frequent cleaning and can be expected to last longer.

Secondly, the fact that the catalytic converter 22 and grease filter 24 are mounted on the front of the baffle plate 14 makes it easier to replace these components, because access

to these components can be readily obtained via the hinged oven door 8. This is in contrast to the arrangements described in the two German patents mentioned above, in which replacement of the catalytic converter requires removal of the baffle plate. It is also in contrast to the arrangement described in PCT/GB00/04156 mentioned above, in which access to the grease filters and catalytic converters cannot be obtained from within the oven cavity, and access to these components therefore involves stripping down of the outer part of the oven.

Thirdly, the position of the catalytic converter 22 and grease filter 24 is ideally suited to the retro-fitting of these components to existing ovens. The retro-fitting of these components to existing ovens, which arises from the realization that these components can be successfully placed in the locations shown in Figure 1, results in a considerable cost saving. Rather than replacing ovens of this type which have an unsatisfactory smoke output, such ovens can be converted to ovens having a much lower smoke output.

Figures 2 and 3 show alternative embodiments of the oven of Figure 1. For simplicity Figures 2 and 3 show only that part of the oven which is contained within the dashed line box 26 shown in Figure 1, and also shown in Figures 2 and 3. In Figures 2 and 3 components which are the same as those of the oven of Figure 1 are shown by the same reference numerals.

In Figure 2 the catalytic converter 22 is mounted to the downstream face of the baffle plate 14, and the grease filter 24 is mounted to the upstream face of the baffle plate 14.

In Figure 3 both the catalytic converter 22 and the grease filter 24 are mounted downstream of the baffle plate 14. The catalytic converter 22 is mounted to the downstream face of the baffle plate 14, and the grease filter 24 is mounted on the downstream side of the catalytic converter 22.

In Figure 1 the air-flow arrows 20 show the air flowing around the two opposite side edges of the baffle plate 14. It should be appreciated that these air-flow arrows are for

illustration only, and in the case of a rectangular baffle plate the air may flow around all four edges of the baffle plate, or around a different number of edges if appropriate.

In still further alternative embodiments, the oven 2 can be of any type, including a conventional electric or gas oven, a microwave combination oven, or a microwave oven (in which case the heating element 18 would not be present).